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ISO/TC 69
CANADIAN DELEGATION REPORT ON ISO/TC 69/SC 6, WG 1 AND WG 4 MEETINGS HELD IN BERLIN, GERMANY, 1989-11-13/17

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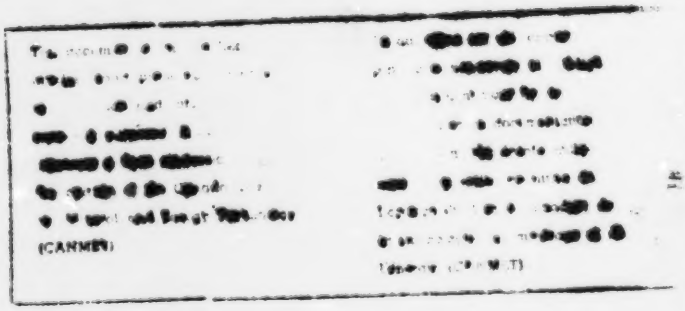

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ISO/TC 69
CANADIAN DELEGATION REPORT ON ISO/TC 69/SC 6, WG 1 AND WG 4 MEETINGS HELD IN BERLIN, GERMANY, 1989-11-13/17

by

R. Sutarno*

SUMMARY

ISO/TC 69 is an ISO technical committee that has been entrusted by the ISO Council, with a function of advisor to all ISO technical committees in matters concerning the application of statistical methods in standardization. For many technical committees, statistical methods are used as a means of measuring and controlling accuracy; an important attribute for international standard methods. To implement this task, ISO/TC 69 is issuing a "flag" standard ISO 5725. Together with various ISO Guides issued by REMCO, this standard will provide all ISO technical committees with a method to measure and control the accuracy of the standard methods they produce. For the consistency of all ISO standards,it is essential that both ISO 5725 and these ISO Guides are accepted by as many ISO technical committees (as well as other organization of interest) as possible. One of the most effective ways to achieve this objective is for ISO/TC 69 in collaboration with REMCO and Central Secretariat to hold a workshop on this subject. Canada, as the originator of this workshop proposal, is requested to take part in its organization. This workshop, which is planned for May 1991, is timely for the following reasons:

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(1) That ISO 5725 will still be at DIS stage. This means that the documents are essentially ready for publication as a standard, and yet it is still possible for the technical committees (the potential users) to propose some modifications in order to suit their particular requirements.

(2) With the dawn of "Europe 1992", it is important for ISO to have such an important standard in place.

Other decisions made at the meeting were:

(a) New working group (WG 5) "Limits of determination" was formed.

(b) To start to work on "Rules for rounding up test results".

(c) To start work on "Test for normality".

(d) To continue to cooperate with the following technical committees:
   (i) ISO/REMCO on the subject of using reference materials for calibration.
   (ii) ISO/TAG 4/WG 3 on the subject of measurement uncertainty.
   (iii) ISO/TC 176 and IEC/TC 56 on the subject of quality assurance.

The acceptance of ISO 5725 by all ISO technical committees is very important since it affects the way most other standards, are developed. For this reason, it is highly recommended that Canada supports the work in organizing this workshop as well as other aspects of ISO/TC 69 work.

This report covers the meeting of ISO/TC 69/SC 6, WG 1 and WG 4, and the second session of ISO/TC 69 meeting held at the Deutsches Institut fur Normung, Berlin, Germany.

Keywords: ISO, precision, trueness, standard, test, statistics

ISO/TC 69/SC 6
APPLICATION OF STATISTICAL METHODS
MEASUREMENT METHODS AND RESULTS

11 th. Meeting

Place : DIN Deutsches Institut fur Normung, Berlin, Germany .

Date : 1989-11-13/16

Member bodies represented: Canada, Denmark, France, Germany, Hungary, Japan, Netherlands, Sweden, UK, USA and USSR.

Secretariat: DIN (Germany).

The subcommittee meeting was held in two sessions: The first session (November 13 afternoon) was chaired by permanent chairman P. T. Wilrich and the second session (November 16 afternoon) by W. Oakland (UK). The plenary subcommittee meeting was basically organizational in nature, the technical discussions were conducted at the working group (WG) meetings which were held concurrently throughout the week.

A new work item on "limits of determination" was approved by the member bodies. A new working group (WG 5) was formed. The convener of this working group is Dr. Hartmann (Germany). Canada is expected to participate.

REPORT FROM WORKING GROUP MEETINGS

Working Group 1 - Revision of ISO 5725, W. Oakland (UK)- Convener.

WG 1 met for two days. The draft ISO 5725: Accuracy (trueness and precision) of measurement methods and results, was discussed clause by clause.

Part 1: General principles and definitions (ISO/TC 69/SC 6 N 123).

Except for a few editorial comments that have to be incorporated to the text, this part is ready for publication as a Draft International Standard (DIS).

Part 2: A basic method for the determination of repeatability and reproducibility of a standard measurement method (ISO/TC 69/SC 6 N 124).

Many technical as well as editorial comments including two negative votes (India and USA) were discussed. Subject to a number of corrections which will be made by the convener, the document is ready for publication as a DIS.

Part 3: Intermediate measures of the precision of a test method (ISO/TC 69/SC 6 N 125).

After lengthy discussion, it was decided that this document still requires major revision. The convener will rewrite it taking into account comments made at the meeting. The revised document will be circulated as another Draft Proposal (DP).

Part 4: Basic methods for estimating the trueness of a test method (ISO/TC69/SC6 N 126)

This part was the work of WG 4 and is ready for publication as a DIS.

Part 5: Alternative methods for the determination of precision of a test method.

This part was supposed to be drafted by USA. Due to the change in the USA delegate to this subcommittee, it was not written. A draft of this document is promised in time for the next meeting.

Part 6: Practical applications (ISO/TC 69/SC 6 N 127).

A number of technical as well as editorial comments were discussed. Subject to a number of corrections which will be made by the convener, the document is ready for publication as DIS.

Working Group 3 - Measurement Uncertainty - D. Frankowski (Germany) - Convener.

This working group is dealing with the measurement uncertainty, both the systematic and the statistical components. This work is closely related to the work of ISO/TAG (Technical Group) 4 - Metrology. A joint meeting was held between TAG 4/WG 3 and TC 69/SC 6/WG 3. Because of a conflict of schedule, Canada was not represented in this meeting.

Working Group 4 - Statistical Aspects of Reference Materials - R. Sutarno (Canada) Convener.

Working Group 4 met on November 14 afternoon. Dr. K. Wandelburg of Bundesanstalt fur Materialforschung und Prufung (BAM) attended the meeting as REMCO representative. WG 4 is working in close cooperation with ISO/REMCO Task Group 2 - Calibration. Topics discussed were:

(1) Draft ISO 5725 Part 4: This document is complete and ready for publication as a DIS.

(2) Uses of Reference Materials for Calibration:

This work is carried out by WG 4 in response to the request of ISO/REMCO to TC 69 to develop statistical aspects of the use of reference materials for calibration of equipment. A survey on the statistical aspects of calibration processes has been made by M. Carey (USA). The result was presented at the meeting. A document outlining the subject was tabled. After lengthy discussion, it was decided that the project on

statistical aspects of calibration processes will be focused on the following:

(a) Calibration process where a material is used as the calibrant, as opposed to calibration process where other equipment is used as the calibrant.

(b) Initially, a document on single point calibration process will be prepared in time for the next meeting. This document will later be expanded to cover multi point calibration processes.

A draft minutes of WG 4 meeting is appended to this report.

Working Group 5 - Limits of Determination.

A short organization meeting was held. A number of documents were distributed for comment. Due to the importance of the subject from both trade and environment maintenance, Canada is willing to participate.

IMPLEMENTATION OF ISO 5725 - IUPAC WORKSHOP, APRIL 1989 IN WASHINGTON DOC. ISO/TC 69/SC 6 N 162

Two members of the subcommittee (P.T. Wilrich and R. Sutarno) who attended the ISO 5725 - IUPAC harmonization workshop held in Washington,D.C., April 1989 reported their impression of the meeting. After discussion, it was decided that, while recognizing that harmonization between ISO procedures and those used by other organizations is a good idea, the timing is not yet ripe. It is more desirable if harmonization within ISO Technical Committees should be done first before embarking on the harmonization with other organizations.

FURTHER DEVELOPMENT OF DOC. ISO/TC 69/SC 6 N 140: "CONFORMITY WITH SPECIFICATIONS - CONSTRUCTION OF SPECIFICATIONS", DOC ISO/TC 69/SC 6 N 169.

There are a number of technical objections on this document that still have to be taken into account. This document will be rewritten by the secretariat and will be recirculated as a draft proposal (DP).

PROPOSAL FOR A "WORKSHOP ON PROTOCOLS FOR ASSESSMENT AND CONTROL OF ACCURACY OF INTERNATIONAL STANDARD METHODS", DOC. ISO/TC 69/SC 6 N 169.

Accuracy is one of the most important criteria of an international standard method of measurement (ISO standard). It must satisfy the requirement of the expected user community. For example, the accuracy of the ISO standard for the determination of total iron in iron ores must satisfy the accuracy required by the iron ore trading community. In order to maintain the consistency of all standard methods published by ISO, the method for the determination, expression and control of accuracy used by all ISO Technical Committees must be harmonized. Accuracy is defined as the closeness of agreement between an observed value or test result and the accepted reference value. It is comprised of two parts: (1) precision, the closeness of agreement between mutually independent test results obtained under prescribed conditions, and (2) trueness, the closeness of agreement between the average value obtained from a large series of observations and an accepted reference value. To control accuracy of a test method, one must control both its precision and its trueness.

Within ISO organization two committees play important roles:

(1) ISO/TC 69, which has a function of advisor to other technical committees in matter concerning the application of statistical methods in standardization, and

(2) ISO/REMCO, a Council committee which deals with aspects of reference materials.

Both of these committees are horizontal committees and between them have produced or are in the midst of producing standard and guides that are appropriate for this purpose. These are ISO 5725, ISO Guides 33 and 35. To maintain consistency within the ISO organization, it is highly desirable to ensure that these standards and guides are acceptable to as many ISO technical committees as possible. For this purpose, a workshop to promote these documents was proposed. This workshop was proposed for April/May 1991 in Geneva. It will be sponsored jointly by ISO/TC 69, ISO/REMCO and ISO Central secretariat. It will be attended by representatives of all ISO technical committees that produce standards on test methods, members of ISO/TC 69, members of ISO/REMCO and representatives of other international organizations having liaison with ISO/TC 69. The subcommittee (SC 6) and the technical committee (TC 69) strongly endorsed this proposal (Resolution 5). Detail of this proposal has been circulated as Document ISO/TC 69/SC 6 N 169E and is appended to this report.

WORK ITEM "NORMALITY TESTS" NEWLY ALLOCATED TO SC 6

This work item was originally an SC 2 work item that was transferred to SC 6. A BSI standard method on this subject is being considered as a candidate method.

ITEMS FOR FUTURE WORK

The subject of a standard on rules for rounding up a test result was discussed. It was agreed that R. Sutarno will search for an existing document for submission to the secretariat of SC 6 for consideration as a candidate standard.

APPROVAL OF RESOLUTIONS AND STATEMENT OF RESULTS

Six resolutions were approved at this meeting. A copy of these resolutions is appended to this report.

ISO/TC 69

APPLICATION OF STATISTICAL METHODS

2 nd Session of Plenary meeting

Place : DIN Deutsches Institut fur Normung, Berlin, Germany .

Date : 1989-11-17

Member bodies represented: Canada, China, Denmark, France, Germany, Hungary, Japan, Netherlands, Uk, USA and USSR.

Secretariat: AFNOR (France).

The followings decisions were made at the second session of the plenary meeting of ISO/TC69:

(2) To appoint Dr. H. Wadsworth of USA as chairman of ISO/TC 69/SC 1.

(3) To appoint Dr. H. Wadsworth as the liaison person between ISO/TC69 and ISO/TC176.

(4) To appoint W. Dennehy of UK as chairman of ISO/TC 69/SC 3.

(5) Mrs. C. Del Cero, Secretary of ISO/TC 69 will produce a catalog of ISO standards on statistical methods for the purpose of standardization.

(6) To sponsor jointly with ISO/REMCO and Central Secretariat the workshop on " Protocols for assessment and control of accuracy of international standard methods". to be held in Geneva, April 29 - May 3, 1991 and to appoint R. Sutarno (Canada), K. Graebig (Secretary of ISO/TC 69/SC6) and C. Del Cero (Secretary of ISO/TC 69) as members of the organizing committee representing ISO/TC 69.

REQUIREMENTS CONCERNING A SUBSEQUENT MEETING

ISO/TC 69 and all its subcommittees and working groups will meet in Ottawa, July 23-27, 1990.

Appendix 1

DRAFT

Minutes of the meeting of ISO/TC 60/SC 6/WG 4

held in Berlin on 15 November 1989

Dr. SUTARNO welcomed Prof. WANDELBURG at this meeting. Prof. WANDELBURG is a member of ISO/REMCO and was mandated by this committee to forward the request of the REMCO that ISO/TC 69/SC 6/WG 4 should help with statistical aspects related to calibration by reference materials.

Report of the Convener

Dr. SUTARNO first reminded the working group that WG 4 has now completed its task in relation to the preparation of part 4 of the revised 5725 norm. This part will be issued as a DIS. As suggested by Dr. OAKLAND, the members of WG 4 would appreciate it if they could receive the finalized version of part 4 before circulation.

Dr. SUTARNO further explained that he was unable to attend the last meeting of TC 69 held in Stockholm. Minutes of this meeting have been drafted by Mr. GRAEBIG (document N14).

Discussion of Document on Calibration

Mrs. CAREY was unable to send a document before the meeting but tabled a draft which, she explained, was the continuation of document N13. She said that the problem of calibration is so vast that she would need guidance. She drew attention to the existence of other documents; e.g., those of TC 147/SC 7 on water quality. Prof. WANDELBURG explained that the starting point for requesting help from ISO/TC 69 by REMCO was a letter of Mr. GRAEBIG to Dr. PARKANY asking not to duplicate at REMCO the work done by TC 69. At the REMCO meeting at Beijing it was decided that REMCO would deal with physical and chemical aspects of calibration by reference materials whereas TC 69 should tackle the statistical aspects.

Mr. CALISTE had prepared a paper on "the use of reference materials for calibration". This is written in French. A translation was expected by September 1989 but nothing has appeared yet. It was agreed that Dr. SUTARNO will request the translation of the paper into English. Then WG 4 could comment on it.

With regard to the document to be drafted by ISO/TC 69 the following questions were raised: should pure chemicals be considered, should other fields than chemical analysis where reference materials are also used for calibration be included. To both questions, the group relied YES. It was decided that a definition of calibration should be provided and that the document should give guidance on the propagation of uncertainties through the calibration process.

Prof. WANDELBURG recommended that members of ISO/TC 69 should not focus on the choice of matrices or on the choice of reference materials in their document. This would be the task of REMCO.

Then the various calibration cases were reviewed. The following were identified that should be treated:

- single point calibration
- bracketing (two points closely embracing the unknown analyte concentration) calibration
- standard addition
- multi point calibration (linear and non linear)

Dr. OAKLAND suggested that WG 4 should start with the single point calibration. Later the multi point calibration consists in establishing the calibration function by the expansion of single point calibrations, will be developed.

Prof. WANDELBURG recalled the work done by Dr. MANDEL and a copy of the paper "Fitting straight lines when both variables are subject to error", (J. of Quality Technology 16, 1 (1984)) was tabled at the meeting.

Mrs. CAREY presented her draft document "Accuracy of calibration process and results" and in particular the model proposed by the NIST described under section 4: Additive model with a single reference standard. This could be the basis of the document related to the single point calibration. She will develop the model and extend on it to demonstrate how two laboratories calibrating against the same reference material should be able to demonstrate that their results agree.

Prof. WANDELBURG suggested that one could start considering in the first instance that the uncertainty of the reference material may be negligible; e.g., as for calibration with pure chemicals. The next step will include reference materials with an uncertainty.

It was agreed that Dr. SUTARNO would write the introduction to this document the title of which would read: "Use of reference materials in one point calibration".

Timetable

Mrs. CAREY is prepared to produce a first draft for the end of February 1990.

Appendix 2

RESOLUTIONS of ISO/TC 69/SC 6 Berlin 1989-11-13 and 16

Resolution 1E 1989

ISO/TC 69/SC 6 establishes a new WG 5 titled "limits of determination". Its terms of reference are to prepare a standard/standards on limits of determination covering terms, definitions, and methods of evaluation. Mr. Dr. Hartmann, Germany, F.R. is appointed to be the convenor.

Resolution 1F 1989

ISO/TC 69/SC 6 procide à la création d'un nouveau GT 5 intitulé "Limites de détermination". Ses termes de référence sont de préparer une ou des normes sur les limites de détermination, y compris les termes, définitions et méthodes d'évaluation. Mr. Dr. Hartmann (RFA) est désigné comme animateur.

Resolution 2E 1989

ISO/TC 69/SC 6 resolves to register document ISO/TC 69/SC 6 N 183 as amended during its meeting 1989-11-13 as a DP and to instruct the secretariat to circulate it to the members of ISO/TC 69/SC 6 for comment and voting.

Resolution 2F 1989

ISO/TC 69/SC 6 décide d'enregistrer comme DP le document ISO/TC 69/SC 6 N 183, tel qu'il a été modifié lors de la réunion (1989-11-13), et de demander au secrétariat de le diffuser aux membres de ISO/TC 69/SC 6 pour commentaires et vote.

Resolution 3E 1989

ISO/TC 69/SC 6 has reached consensus about ISO/DP 5725-2 = document ISO/TC 69/SC 6 N 124 and ISO/DP 5725-6 = document ISO/TC 69/SC 6 N 127 as amended by ISO/TC 69/SC 6/WG 1 during its meeting on 1989-11-14 and 15 and instructs its secretariat to take the necessary steps to submit these documents to the ISO CS for circulation as draft international standards for approval.

Resolution 3F 1989

ISO/TC 69/SC 6 s'est mis d'accord sur ISO/DP 5725-2 (document ISO/TC 69/SC 6 N 124) et ISO/DP 5725-6 (document ISO/TC 69/SC 6 N 127), modifiés par ISO/TC 69/SC 6/WG 1 lors de sa réunion 1989-11-14 and 15 et demande au secrétariat de faire le nécessaire pour soumettre ces documents à ISO/CS pour diffusion et approbation en tant que DIS.

Resolution 4E 1989

ISO/TC 69/SC 6 having taken notice of the recommendation from the joint meeting of ISO/TAG 4/WG 3 and ISO/TC 69/SC 6/WG 3 on 15 November, 1989 at DIN, Berlin resolves that ISO/TC 69/SC 6/WG 3 shall continue their work and their collaboration with ISO/TAG 4/WG 3 and expects that no publication of these WG's in the field of measurement uncertainty will be made until agreement is achieved.

Resolution 4F 1989

ISO/TC 69/SC 6, ayant pris connaissance de la recommandation du joint réunion de l'ISO/TAG 4/WG 3 et l'ISO/TC 69/SC 6/WG 3 poursuiva ses travaux et sa collaboration avec ISO/TAG 4/WG 3 et est fondi à penser qu'aucune publicationn de ces WG dans le domaine de l'incertitude des mesures n'aura lieu avant que l'accord soix réalisé.

Resolution 5E 1989

ISO/TC 69/SC 6 commends the proposal from Dr. Sutarno that a workshop be held in Geneva in 1991 (ISO/TC 69/SC 6 N 169) and that this be held in conjunction with a meeting of SC 6, and requests TC 69 to support this proposal and be involved in the organization of the workshop.

Resolution 5F 1989

ISO/TC 69/SC 6 adopte la proposition de Dr. Sutarno concernant la tenue d'un atelier à Genève en 1991 (ISO/TC 69/SC 6 N 169), conjointement à une réunion de SC 6, et demande à TC 69 de soutenir cette proposition et de prendre part à l'organisation de l'atelier.

Resolution 6E 1989

Following the request from REMCO that ISO/TC 69 begin work on the topic of "Use of Reference Material for Calibration", ISO/TC 69/SC 6 resolves to ask ISO/TC 69 to establish a corresponding new work item and to allocate it to ISO/TC 69/SC 6.

Resolution 6F 1989

Conformément à la demande de REMCO recomendant que ISO/TC 69 commence à travailler sur le sujet "Utilisation des Matériaux de Réference pour Calibration", ISO/TC 69/SC 6 décide de demander à ISO/TC 69 d'établir une nouvelle question sur ce sujet et de l'attribuer à ISO/TC 69/SC 6.

Appendix 3

PROPOSAL FOR A WORKSHOP ON PROTOCOLS FOR ASSESSMENT AND CONTROL OF ACCURACY OF INTERNATIONAL STANDARD METHODS.

(Contribution of R. Sutarno, Canada)

Accuracy is one of the most important criteria of an international standard method of measurement (ISO standard). It must satisfy the accuracy requirement of the expected user community. For example, the accuracy of the ISO standard for the determination of total iron in iron ores must satisfy the accuracy required by the iron ore trading community.

Accuracy, which is defined as the closeness of agreement between an observed value or test result and the accepted reference value, comprises of two parts: (1) precision, the closeness of agreement between mutually independent test results obtained under prescribed conditions, and (2) trueness, the closeness of agreement between the average value obtained from a large series of observations and an accepted reference value.

Accuracy of an ISO standard must be assessed during the development and must be controlled during the routine application of the standard. Both the assessment and the control of the precision are carried out by the proper application of statistical methods, while the assessment and the control of the trueness are carried out by proper use of suitable reference materials.

ISO/TC 69 has been entrusted by ISO Council with the function of advisor to all ISO technical committees in matters concerning the application of statistical methods in standardization (resolution 12 - Council 1959 and Resolution 26 - Council 1961). As for matters related to reference materials, ISO Council has created a Committee on reference materials for which the terms of reference, among others, are: (1) to prepare guidelines for technical committees for making reference to reference materials in ISO documents and (2) to propose, as far as necessary, action to be taken on reference materials required for ISO work. In order to harmonize the work of technical committees within ISO, a good liaison between these two committees and other technical committees is necessary.

Presently, ISO/TC 69/SC 6 is in the midst of revising and expanding ISO 5725: Accuracy (trueness and precision) of measurement methods and results. The revised form of this standard, which is scheduled for completion in 1990, is a comprehensive document for the assessment and control of accuracy of measurement methods. ISO/REMCO has published a number of ISO Guides describing various aspects of reference materials including their definitions, methods of preparation and uses. An understanding of these documents is essential for technical committees in order that they may be able to assess and control of the accuracy of the ISO standard methods they are developing. For this reason the following workshop on this subject is proposed.

Title: WORKSHOP ON PROTOCOLS FOR ASSESSMENT AND CONTROL OF ACCURACY OF INTERNATIONAL STANDARD METHODS.

Sponsorship: This workshop will be sponsored jointly by ISO/REMCO, ISO/TC 69 and ISO Central Secretariat.

Language: English and French.

Format: Formal presentations followed by informal discussion.

Suggested topics for formal presentations:

1. Presentation of ISO 5725 Parts 1 to 6, by members of ISO/TC 69/SC 6.

2. Presentation of ISO Guides 30, 31, 33 and 35, by members of ISO/REMCO.

3. Presentation of practice used by some technical committees for assessing and controlling accuracy of the ISO standard methods that they produce, by the members of the technical committees.

4. Problems on implementation of ISO 5725 and ISO Guides in the technical committees' work, by members of the technical committees concerned.

5. Demonstration of COMAR reference materials data base, by member of ISO/REMCO.

Informal discussion of the above topics.

Participants: In order to be successful, particularly in the informal discussion part, this workshop should involve the participation of as many members of ISO/TC 69/SC 6 and ISO/REMCO as possible, and of representatives of interested technical committees and /or subcommittees (Chairpersons, Secretaries, Working Group conveners and/or persons in charge of statistical matters within the subcommittees). This can be accomplished by holding this workshop in conjunction with the annual meetings of both ISO/TC 69/SC 6 and ISO/REMCO.

Duration: Total of five days (three days of parallel committee meetings and a two day workshop, or vice versa)

Location: Geneva, Switzerland.

Date: 1991 (Summer or fall).